DOE/ID-11078
Revision 1
Project No. 23095

June 2004

U.S. Department of Energy
Idaho Operations Office

Field Sampling Plan for Group 3, PM-2A Tanks for Test Area North, Waste Area Group 1, Operable Unit 1-10

INEEL
Idaho National Engineering and Environmental Laboratory
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Approved by

for Gary McDaniel — 6/21/04

Gary E. McDaniel — Date
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6-21-04

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PM-2A Project Manager

6/21/04

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TAN Subproject -1 Project Manager

ABSTRACT

This field sampling plan describes the Waste Area Group 1, Operable Unit 1-10, Group 3 remedial action confirmation field sampling activities to be performed during Phase 1 remedial actions at the Idaho National Engineering and Environmental Laboratory for the PM-2A tanks (Technical Support Facility-26) site. The sampling activities described in this plan support the remedial actions presented in the *Record of Decision Amendment for the V-Tanks (TSF-09 and TSF-18) and Explanation of Significant Differences for the PM-2A tanks (TSF-26) and TSF-06, Area 10, at Test Area North, Operable Unit 1-10 at the Idaho National Engineering and Environmental Laboratory, Idaho Falls, Idaho* and are in accordance with the *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory*.

The sampling strategy for this sampling plan addresses sampling requirements identified for the remedial actions. The results of these sampling efforts will ensure that institutional controls applied following completion of remedial actions are appropriate and are protective of human health and the environment.

This field sampling plan addresses all aspects of confirmation sampling, including sampling, quality assurance, quality control, and analytical procedures. Full implementation of the field sampling plan will ensure that the data are scientifically valid, defensible, and of known and acceptable quality. The *Quality Assurance Project Plan for Waste Area Group 1, 2, 3, 4, 5, 6, 7, 10, and Inactive Sites* describes quality assurance/quality control protocols that will achieve the specified sampling strategy.

CONTENTS

FIGURES

TABLES

ACRONYMS

AL	action level
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Program
D&D	decontamination and decommissioning
DOE	Department of Energy
DOT	Department of Transportation
EPA	Environmental Protection Agency
ER	environmental restoration
ESD	explanation of significant differences
ESH&QA	environment, safety, health, and quality assurance
FFA/CO	Federal Facility Agreement and Consent Order
FR	Federal Register
FRG	final remediation goal
FSP	field sampling plan
FTL	field team leader
HASP	health and safety plan
HSO	health and safety officer
HWMA	Hazardous Waste Management Act
ICDF	INEEL CERCLA disposal facility
INEEL	Idaho National Engineering and Environmental Laboratory
MCP	management control procedure
NaI	sodium iodide
OSHA	Occupational Safety and Health Administration
OU	operable unit

PCB	polychlorinated biphenyl
PM	project manager
PPE	personal protective equipment
PRD	program requirements document
QA	quality assurance
QAPjP	quality assurance project plan
RA	remedial action
RCRA	Resource Conservation and Recovery Act
RD/RAWP	remedial design/remedial action work plan
RI/FS	remedial investigation/feasibility study
ROD	record of decision
RWMC	Radioactive Waste Management Complex
SVOC	semivolatile organic compound
TAN	Test Area North
TCLP	toxicity characteristic leaching procedure
TEM	template
TSF	Technical Support Facility
UCL	upper confidence limit
USC	U.S. Code
VOC	volatile organic compound
WAC	Waste Acceptance Criteria
WAG	Waste Area Group
WMP	waste management plan

Field Sampling Plan for Group 3, PM-2A Tanks for Test Area North, Waste Area Group 1, Operable Unit 1-10

1. INTRODUCTION

This field sampling plan (FSP), when implemented with the current revision of the *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Deactivation, Decontamination, and Decommissioning* (DOE-ID 2004a), comprises the confirmation sampling and analysis plan for the Idaho National Engineering and Environmental Laboratory (INEEL) Waste Area Group (WAG) 1, Test Area North (TAN), Operable Unit (OU) 1-10, Group 3 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S. Code [USC] 9601 et seq., 1980) remedial actions.

This FSP, prepared in accordance with the Federal Facility Agreement and Consent Order (FFA/CO) (DOE-ID 1991), outlines the sampling requirements and quality assurance (QA), quality control, and analytical procedures to support PM-2A Phase 1 remedial actions. The quality assurance project plan (QAPjP) describes QA/quality control protocols that will be followed to achieve the specified sampling strategy. Use of this FSP will help ensure that data are scientifically valid, defensible, and of known and acceptable quality, while use of the QAPjP will ensure that the data generated are suitable for their intended purposes.

This FSP is identified as a secondary document under the FFA/CO and fulfills the specified FFA/CO requirements. The QAPjP and this FSP have been prepared pursuant to the National Oil and Hazardous Substances Contingency Plan (55 FR 46), the *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (EPA 1988), the FFA/CO and INEEL Management Control Procedure (MCP)-9439, "Preparation for Environmental Sampling Activities," and Template (TEM)-104, "Template Model for Preparation of Characterization Plans."

1.1 Field Sampling Plan Objectives

The overall objective of this FSP is to guide the collection and analyses of samples following implementation of the selected remedial actions for the PM-2A tanks site presented in the *Final Record of Decision for Test Area North, Operable Unit 1-10* (DOE-ID 1999). The record of decision (ROD)-selected remedy for the PM-2A tanks is documented in the *Record of Decision Amendment for the V-Tanks (TSF-09 and TSF-18) and Explanation of Significant Differences for the PM-2A tanks (TSF-26) and TSF-06, Area 10, at Test Area North, Operable Unit 1-10 at the Idaho National Engineering and Environmental Laboratory, Idaho Falls, Idaho* (DOE-ID 2004b). Based on reevaluation of the remedial design for the PM-2A tanks and the planning process to support accelerated cleanup at TAN, a significant change to the remedy selected in the OU 1-10 ROD was identified. Specifically, rather than removing the waste inventory and treating, as necessary, decontaminating the tanks and leaving the tanks in place, the tanks will be removed with the waste inventory in the tanks, the waste inventory treated, as necessary, and the tanks and the waste disposed of as CERCLA remediation-derived waste at the INEEL CERCLA disposal facility (ICDF) or other approved facility. Phase 1 remedial actions include tank removal and site restoration. Waste treatment, if determined necessary, and disposal will be addressed during Phase 2. Additional information on the PM-2A tanks and planned remedial actions can be found in the remedial design/remedial action work plan (RD/RAWP) amendment (DOE-Idaho 2004) and supporting documents (INEEL 2004a, 2004b).

Remediation of the PM-2A tanks site is governed by the Hazardous Waste Management Act (HWMA) (HWMA 1983)/Resource Conservation and Recovery Act (RCRA) (42 USC 6901 et seq., 1976) and CERCLA (42 USC 9601 et seq., 1980). Tank system closure requirements for the PM-2A tanks are specified in the *Hazardous Waste Management Act/Resource Conservation and Recovery Act Closure Plan for the Test Area North/Technical Support Facility Intermediate-Level Radioactive Waste Management System – Phase III: Intermediate-Level Radioactive Waste Holding Tank Subsystem (PM-2A Tanks)* (DOE-ID 2004c); the CERCLA requirements are specified in the OU 1-10 ROD (DOE-ID 1999) and explanation of significant differences (ESD) (DOE-ID 2004b). The closure plan requires that soil samples be collected to ensure that the final remediation goal (FRG) for the Technical Support Facility (TSF)-26 site appropriately addresses HWMA/RCRA constituents as described below. Because feed piping to the PM-2A tanks will not be pressure tested to confirm integrity, soil samples will be collected along the piping and at identified potential release points in accordance with the *Contingent Field Sampling Plan for the HWMA/RCRA Closure of the Test Area North/Technical Support Facility Intermediate-Level Radioactive Waste Holding Tank Subsystem (PM-2A Tanks)* (ICP 2004). These soil samples, which will be analyzed for both HWMA/RCRA and radiological constituents, will be used as a basis to show that these soils meet the FRG specified in the ROD. If soil contamination is identified that exceeds the FRG, or additional FRGs are determined necessary based on evaluation of the data obtained, this FSP will be modified to address the identified area(s) of contamination.

Soil samples from beneath the PM-2A tanks will only be collected under the HWMA/RCRA contingent FSP if a potential release is identified based on the criteria specified in the HWMA/RCRA closure plan (DOE-ID 2004c). If it is determined following tank removal that a release may have occurred, the tank cradles and sand pads will be removed and disposed of as CERCLA remediation-derived waste and soil samples directly beneath the tank cradles will be collected in accordance with the HWMA/RCRA contingent FSP (ICP 2004). Samples collected under the HWMA/RCRA FSP will be used to determine whether the FRGs established for the site adequately address all COCs. These samples if collected will be used to support the ROD requirement to sample identified releases.

The CERCLA confirmation samples will be collected from the tank excavation at a depth >10 ft below ground surface (bgs) to determine the mean Cs-137 activity remaining in the soils. Analytical data from soils >10 ft bgs will be used to ensure that adequate institutional controls (ICs) are in place to protect human health and the environment. This FSP addresses collection of CERCLA confirmation samples collected at greater than 10 ft bgs. Sampling of soils between 0–10 ft bgs will be addressed under the RD/RAWP amendment (DOE-Idaho 2004).

2. SITE BACKGROUND

The INEEL, a government-owned facility managed by DOE, is located in southeastern Idaho, 51.5-km (32-miles) west of Idaho Falls, as shown in Figure 2-1. The INEEL encompasses approximately 2,305 km^2 (890 mi^2) of the northwestern portion of the Eastern Snake River Plain, and extends into portions of five Idaho counties.

In November 1989, because of confirmed contaminant releases to the environment, the Environmental Protection Agency (EPA) placed the INEEL on the National Priorities List of the National Oil and Hazardous Substances Contingency Plan (54 Federal Register 48184). In response to this listing, the DOE, EPA, and the Idaho Department of Environmental Quality (hereinafter referred to as the Agencies) negotiated the FFA/CO and Action Plan (DOE-ID 1991). The Agencies signed these documents in 1991, establishing the procedural framework and schedule for developing, prioritizing, implementing, and monitoring response actions at the INEEL in accordance with CERCLA, RCRA, and the Idaho HWMA.

To better manage cleanup activities, the INEEL was divided into 10 WAGs. Test Area North, shown in Figure 2-2, is designated as WAG 1 and includes fenced areas and areas immediately outside the fence lines at the TSF, Initial Engine Test facility, Loss-of-Fluid Test facility, Specific Manufacturing Capability facility, and Water Reactor Research Test Facility (DOE-ID 1999). Since its construction in 1954, TAN has supported numerous research and testing projects, including development and testing of designs for nuclear-powered aircraft engines, reactor safety testing and behavior studies, armor manufacturing, nuclear inspections, and storage operations.

The FFA/CO established 10 OUs within WAG 1 consisting of 94 potential release sites (DOE-ID 1999), which include various types of pits, spill sites, ponds, aboveground and underground storage tanks, and a railroad turntable. A comprehensive remedial investigation/feasibility study (RI/FS) was initiated in 1995 to determine the nature and extent of the contamination at TAN under OU 1-10, defined in the FFA/CO as the *Comprehensive Remedial Investigation/Feasibility Study for the Test Area North Operable Unit 1-10 at the Idaho National Engineering and Environmental Laboratory* (DOE-ID 1997). The OU 1-10 remedial investigation/feasibility study (RI/FS) culminated with the finalization of the OU 1-10 ROD (DOE-ID 1999), which provides information to support remedial actions for eight sites where contaminants present an unacceptable risk to human health and the environment.

Final remediation goals were established for each site to ensure risk-based protection of human health and the environment by providing for unrestricted land use in 100 years. These goals, which are both contaminant- and site-specific, are quantitative cleanup levels based primarily on applicable or relevant and appropriate requirements and risk-based doses. The sampling described in this plan will take place in the excavation footprint following removal of the PM-2A tanks and, if necessary, the concrete cradles. Because the base of the excavation footprint is >10 ft bgs, and no FRGs have been established for site TSF-26 for this depth, the sampling described in this plan will be used to establish ICs that are protective of human health and the environment following remedial activities. Soils between 0 and 10 ft. bgs will be addressed for compliance with FRGs under the RD/RAWP amendment (DOE-Idaho 2004).

2.1 PM-2A Tanks Site

The TAN OU 1-10 TSF-26 site was subdivided for remediation purposes. Site TSF-26 surface soils, included in Group 1, are assumed to extend 10 ft bgs above the PM-2A tanks. The remaining soil above the tanks, the tanks themselves, the cradles, and ancillary piping are considered the PM-2A tanks

site within Group 3. Specifically, the PM-2A tanks site consists of two abandoned 189,270-L (50,000-gal) carbon steel underground storage tanks, their concrete cradles (containment troughs), feed piping, the waste contents of the tanks, and the contaminated soils associated with the tanks (see Figure 2-3).

The tanks, designated as V-13 and V-14, were installed in the mid-1950s to store low-level radioactive waste from the TAN evaporator and acted as feed tanks for the PM-2A temporary evaporator until 1975. In the early 1980s the PM-2A evaporator was decontaminated and decommissioned. The tanks currently contain F001-listed (chlorinated solvents, primarily perchloroethylene and trichloroethylene) mixed waste contaminated with radionuclides and heavy metals) mixed waste contaminated with radionuclides and heavy metals. Residual liquids are also present in the V-14 tank (the west tank). The soil above and in the general area of the tanks was contaminated from occasional spills during routine operations (i.e., from leaks and spills during the removal and treatment of the liquid waste). No releases are known to have occurred from the tanks themselves.

2.2 Previous Investigations

During operations, the PM-2A tanks area was surveyed for radiological contamination due to the leaks and spills, and several inches of gravel were placed over the contaminated soil to reduce the observed radiation fields. In 1982, decontamination and decommissioning (D&D) of the PM-2A tank system was conducted. Most of the liquids in the PM-2A tanks were pumped into concrete containers, mixed with cement, and shipped to the Radioactive Waste Management Complex (RWMC).

The soils surrounding the PM-2A tanks were evaluated in 1988 during a DOE environmental survey. Four borings were drilled near the PM-2A tanks, and radiological analyses were performed, which showed levels of Cs-137 contamination (1.7–120 pCi/g) in the soil to at least 5.2 m (17 ft) bgs (DOE-ID 1997).

In 1993 a Track 2 investigation was performed at the TSF-26 site (INEL 1994). Based on the results of the Track 2 investigation, a non-time-critical removal action under OU 10-06 was performed at the TSF-26 site in 1995, removing contaminated soil above a 15-pCi/g field screening action level (AL) (DOE-ID 1996). In August 2000 radiological sampling for TSF-26 site was performed to obtain data regarding the vertical nature and extent of contamination to support future remedial actions (INEEL 2002).

During spring 2003 soil samples were collected to obtain additional data to support and direct the selected remedy in the OU 1-10 ROD. Soil samples were collected alongside the PM-2A tanks cradles down to basalt and from the bedding material within the cradles. Samples were collected for metals, semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), polychlorinated biphenyls, and radionuclide analyses. The sampling results confirm that the contamination present is likely from surface spills or releases with the contamination concentration decreasing with depth. Samples collected near the bottom of the tanks indicate that the soils beneath the tanks and the soils surrounding, within, and beneath the concrete cradles are not significantly contaminated. Most of the samples taken at the tank level or lower showed contaminant concentrations close to background levels.

In addition to this soil sampling, the contents from both of the PM-2A tanks (Tanks V-13 and V-14) were sampled in summer 2003 for characterization and disposal information. These samples were analyzed for metals, VOCs, SVOCs, polychlorinated biphenyls, miscellaneous analyses (total halogens, reactive sulfides, cyanides, and fluorides, and pH), radioactive and toxicity characterization leaching procedure analyses (for metals, VOCs, SVOCs, herbicides, and pesticides) (Hain 2004).

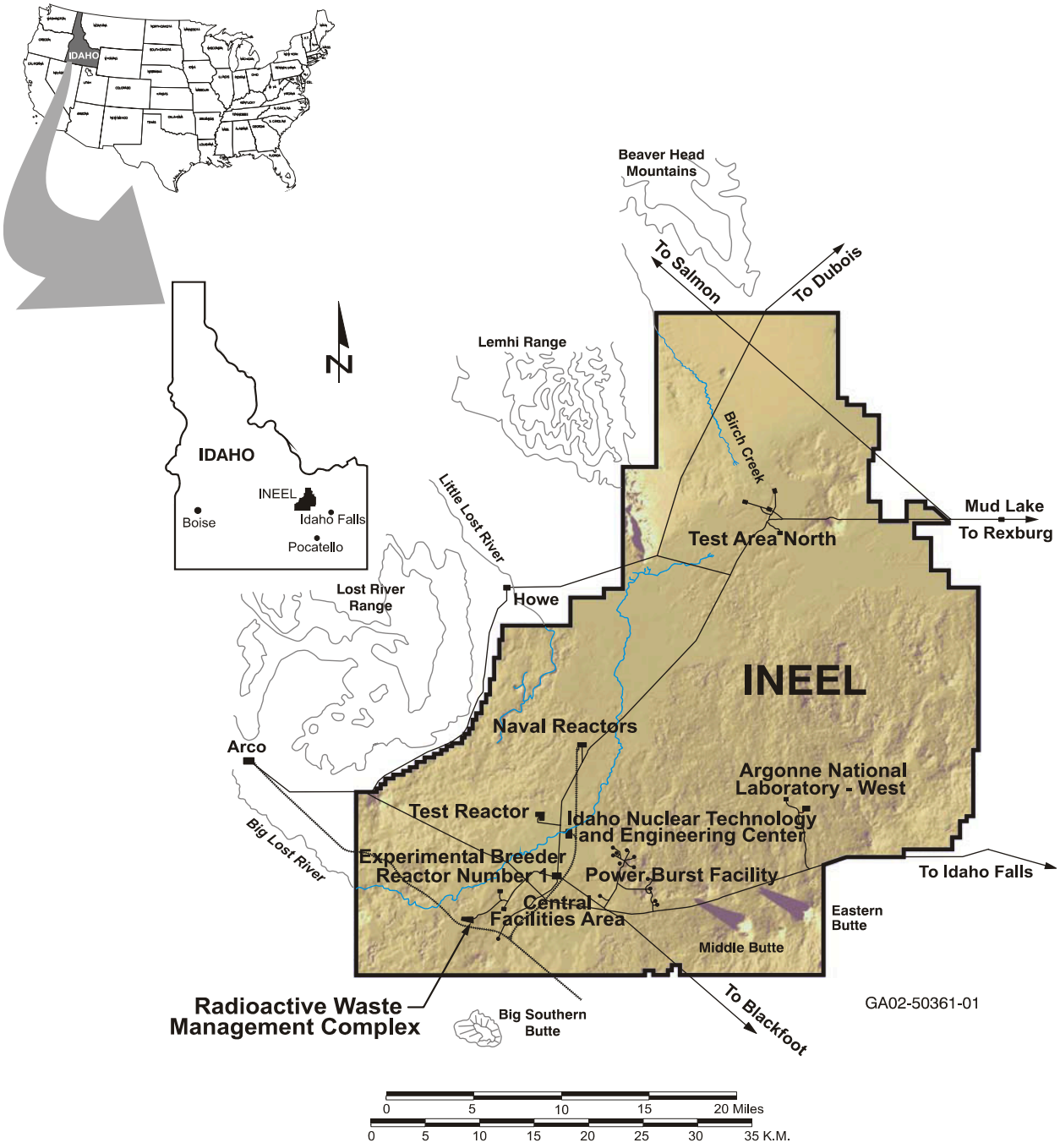


Figure 2-1. Location of the Idaho National Engineering and Environmental Laboratory.

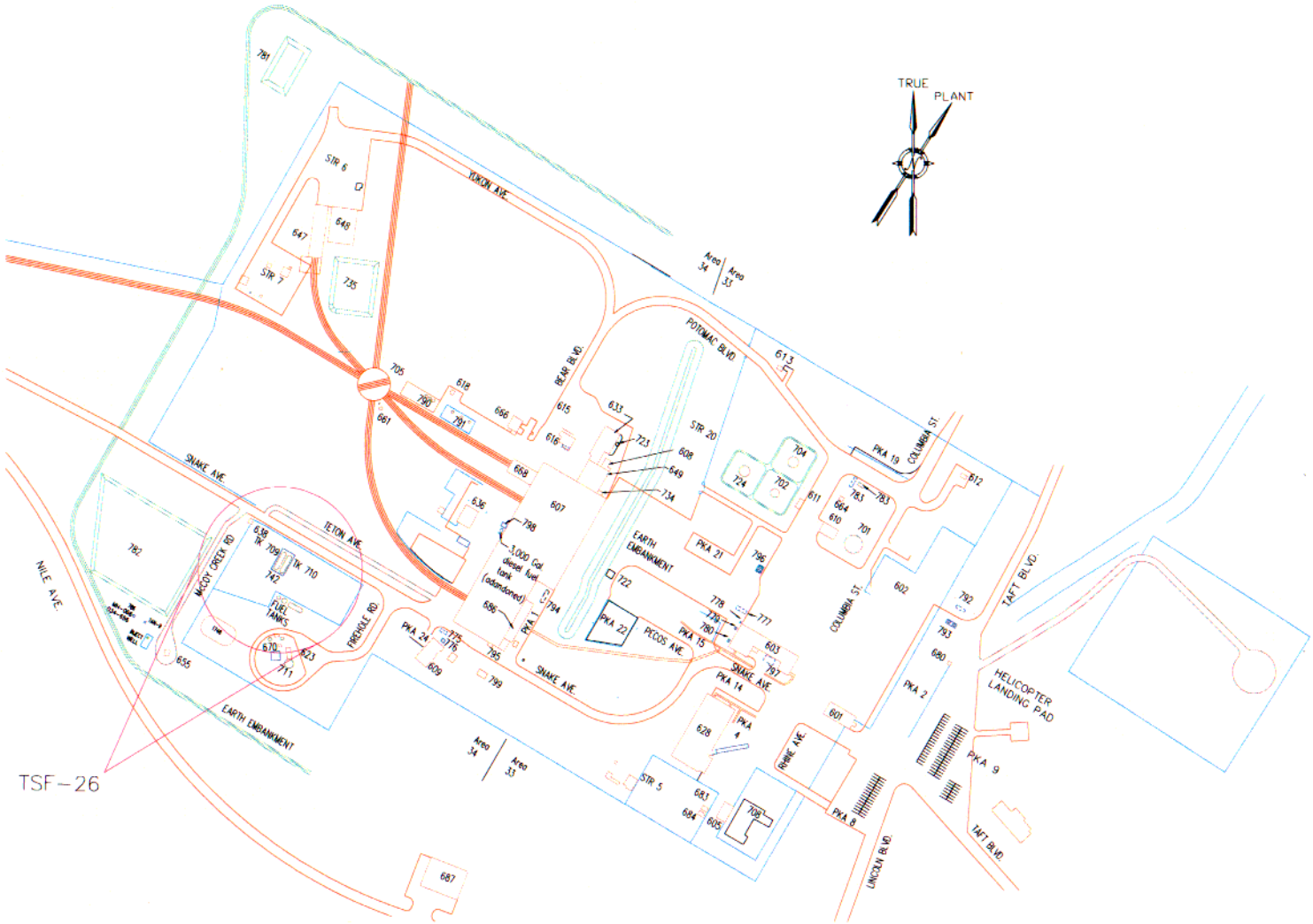
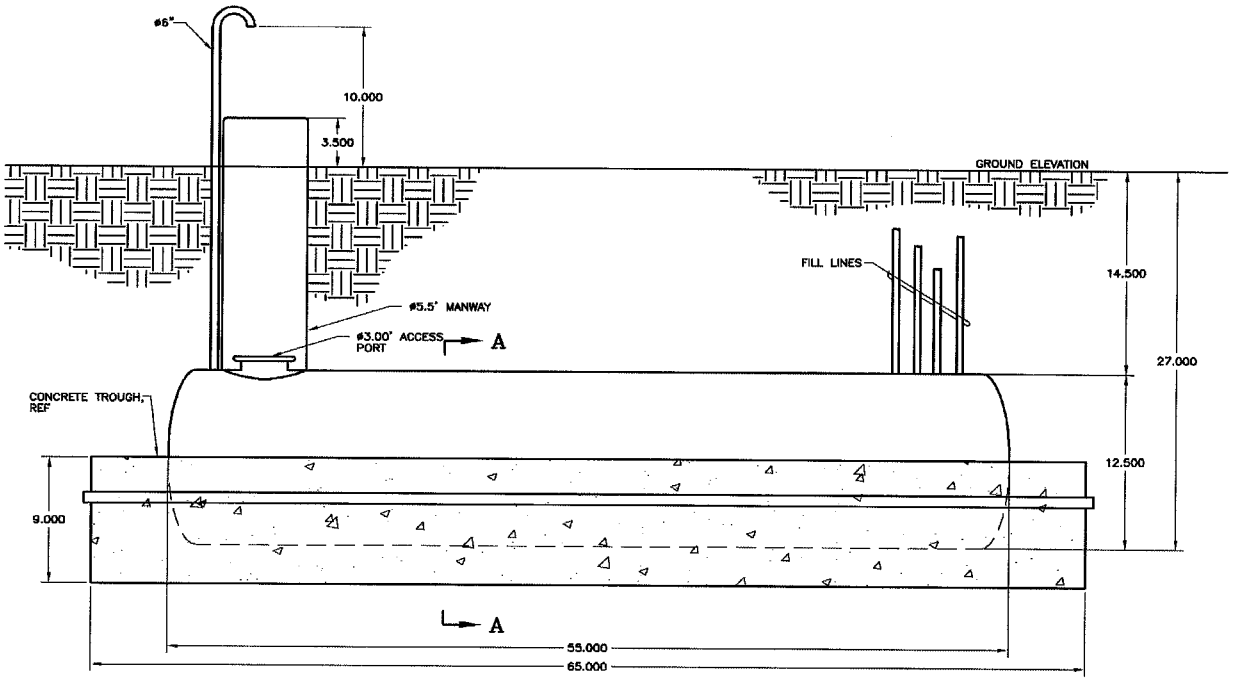
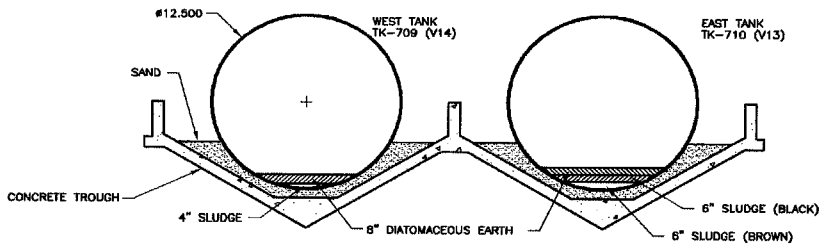


Figure 2-2. Waste Area Group 1 Test Area North/Technical Support Facility.



a. Elevation: Looking West at Tank 710



Note: The sludge layers were measured before the diatomaceous earth was deposited.

b. Section A–A: Looking North

Figure 2-3. PM-2A tanks site.

3. PROJECT ORGANIZATION AND RESPONSIBILITIES

A clearly defined project organization is essential to ensure that the project remediation objectives are achieved and that data collection, reporting, evaluation, and interpretation requirements are met. The following subsections outline the specific responsibilities of key site personnel.

3.1 Key Personnel Responsibilities

Responsibilities for key personnel associated with the field activities described in this FSP are outlined in the following subsections.

3.1.1 Project Manager

The TAN SP-1 project manager (PM) or designee will ensure that all activities conducted during the project comply with INEEL MCPs, program requirements documents (PRDs), and all applicable Occupational Safety and Health Administration (OSHA), EPA, DOE, Department of Transportation, and State of Idaho requirements. The PM or designee coordinates all document preparation and all field, laboratory, data evaluation, risk assessment, dose assessment, and closure design activities. The TAN SP-1 PM is responsible for the overall work scope, schedule, and budget.

3.1.2 Field Team Leader

The field team leader (FTL) or designee will be delegated responsibility for the safe and successful completion of the sampling activities outlined in this FSP. The FTL or designee works with the environment, safety, health, and quality assurance (ESH&QA) oversight personnel and the field team to manage field sampling-related operations and to execute this FSP. The FTL or designee enforces site control, documents activities, and conducts the daily safety briefings at the start of each shift. Health and safety issues may be brought to the attention of the FTL or designee by any team member.

The FTL or designee serves as the representative for the Environmental Restoration Program at the site. The FTL or designee is responsible for field activities, crafts personnel, and other personnel assigned to work at the site. The FTL or designee will serve as the interface between facility operations and project personnel and will work closely with the sampling team at the site to ensure that the objectives of the project are accomplished in a safe and efficient manner. The FTL or designee will work with all other identified project personnel to accomplish day-to-day operations at the site, identify and obtain additional resources needed at the site, and interact with the ESH&QA oversight personnel on matters regarding health and safety. The FTL or designee will conduct all daily pre-job briefings and ensure that the work package is signed daily.

3.1.3 ESH&QA Oversight

The ESH&QA oversight personnel are the primary source for information regarding hazardous and toxic agents at the site. The ESH&QA oversight personnel assess the potential for worker exposures to hazardous agents according to the INEEL Safety and Health Manual, MCPs, PRDs, and accepted industrial hygiene practices and protocol. The ESH&QA oversight personnel will ensure that all work is performed in accordance with INEEL STD-101 and MCP-3562 (as applicable). By participating in site characterization, ESH&QA oversight personnel ensure appropriate ESH&QA controls are in place during sampling activities.

3.1.4 Waste Generator Services

The INEEL Waste Generator Services waste technical specialist will ensure that disposition of waste material is in compliance with identified guidance. The Waste Generator Services personnel have the responsibility to help solve waste management issues at the task site. Personnel also prepare the appropriate documentation for waste disposal and make the proper notifications, as required. All wastes will be managed and disposed according to the project waste management plan (WMP) (INEEL 2004a).

3.1.5 Radiological Control

Radiological control personnel will be involved with all aspects of the project where radiation exposure is of concern. To monitor the work environment for field personnel and to ensure the safety of laboratory personnel at INEEL laboratories, all activities will comply with INEEL MCPs. The radiological controls and personnel monitoring requirements established for this sampling effort in the project HASP (INEEL 2004c) are based on personnel dose received and radiological survey data collected during past work activities at the site. These data will be used to implement ALs that will help ensure that all work activities and personnel exposure to direct radiation are maintained as low as reasonably achievable.

3.1.6 Sampling Team

The sampling team will consist of experienced sampling personnel who are fully trained and skilled in the standard sampling procedures for sampling soils as well as decontamination procedures, and ESH&QA requirements. All sampling team personnel will have read the HASP and have necessary training including OSHA hazardous waste site worker training, radiation worker training, and other applicable training. At the end of each sampling effort, the sampling team will be responsible for removal and transport of any sampling equipment brought into the sampling area to a decontamination area as applicable to their assigned responsibilities. Waste management will be performed in accordance with the provisions outlined in the project-specific WMP (INEEL 2004a).

3.2 Non-Field Team Members/Visitors

All persons on the work site who are not part of the field team (e.g., surveyor, equipment operator, or other craft personnel not assigned to the project) are considered non-field team members or visitors for the purposes of this project. A person will be considered “onsite” when they are present in the contamination reduction zone or no longer in the designated support zone. Per 29 CFR 1910.120 and 1926.65, non-field team members are considered occasional site workers and must comply with the following requirements:

- Receive any additional site-specific training identified in the project HASP (INEEL 2004c) prior to entering beyond the support zone of the project site
- Meet all required training for the tasks being performed, as identified in the project HASP
- Meet minimum training requirements for such workers as described in the OSHA standard
- Meet the same training requirements as the workers if the non-worker’s tasks require entry into the work control zone.

Training must be documented and a copy of the documentation must be incorporated into the project case file. A site supervisor (e.g., health and safety officer [HSO] or FTL) will supervise all non-field team personnel who have not completed their three days of supervised field experience, in accordance with the Hazardous Waste Operations standard. Non-field team members/visitors may not be allowed beyond the support zone during certain project site tasks (e.g., drilling) to minimize safety and health hazards. The determination of any visitor's "need" for access beyond the support zone at the project site will be made by the HSO in consultation with TAN radiological control personnel (as appropriate).

3.3 Points of Contact

Table 3-1 lists the key points of contact for the TAN, WAG 1, and OU 1-10 field activities for the PM-2A tanks site. The personnel listed in the table are those persons to be contacted as a part of sampling operations. This table is subject to change due to reassignment of personnel. A current copy of this table will be posted at the job site for reference during all project activities. Revisions to this table will not require a document action request because the current job positions will be posted at the job site.

Table 3-1. PM-2A tanks site points of contact.

Name	Title	Telephone Number
Al Jantz	WAG 1 Project Manager	526-3050
Lisa Wolford	Subproject-1 Project Manager	526-6914
Alvah Bingham	PM-2A Project Manager	526-3033
Dave Eaton	WAG 1 Regulatory Support	526-7002
Gary McDannel	WAG 1 Project Engineer	526-5076
Al Yonk	PM-2A Project Engineer	526-5828
Randy Sayer	Health and Safety Officer	526-5706
Mark Elliott	Field Engineer	526-0872
To Be Assigned	Field Team Leader	–
Nate Wegener	Industrial Hygienist	526-5213
B. P. Shagula	Safety Engineer	526-0585
Bruce Hendrix	Fire Protection Engineer	526-7989
Alan Nellesen	TAN Radiological Control Manager	526-4165
John Harris/Marshall Marlor	Waste Generator Services Contact	526-3461/526-2581
Al Millhouse	TAN Facilities Manager	526-6932
James Rider	QA Engineer	526-2534
Bob Clark	TAN Construction Manager	526-5236

4. Confirmation Screening/Sampling

Following excavation and removal of the PM-2A tanks at TSF-26, confirmation screening/sampling will be conducted to verify the remaining residual soil (including the sand and cradles if left in place) concentration population mean at the 95% upper confidence limit (UCL) to support the determination of whether institutional controls are necessary to prevent unacceptable risk based upon unrestricted use. Institutional controls will be implemented if the 95% UCL on the population mean exceeds 2.3 pCi/g Cs-137. Figure 4-1 graphically describes the confirmation screening/sampling logic.

- Wide Area Screening—The area from elevation 4771 (10 ft below original grade) on the side slopes of the excavation to the bottom of the excavation will be divided into appropriate grids (each approximately 35 ft square or smaller) and each grid subjected to a wide-area screen with a high-purity germanium detector to accurately measure the concentration of Cs-137. See Figure 4-2 for preliminary wide-area screening grid. These wide-area screens will cover the entire excavated area. If additional excavation is undertaken to remove areas with elevated levels of contamination, these areas will be rescreened prior to undertaking the final confirmation sampling.

- Screening Confirmation Sampling—Biased confirmation samples will be collected from those excavated areas with the highest counts to ensure that the remaining soils meet the FRG. Twenty percent of the grid locations previously screened will be sampled in this biased manner to confirm the relative accuracy of the screening. Each of those samples will be submitted for a 20-minute (or greater) gamma spectrometric analysis. These samples will be used to confirm the relative accuracy of the wide-area screening approach.

- If the screening confirmation samples do not confirm the relative accuracy of the wide-area screen, the wide-area screens and screening confirmation sampling will be repeated using a smaller grid size appropriate to the size of the excavation that at a minimum increases the number of grid points by at least a factor of two.

- The final results from the wide area screening confirmation process will be used to assess the need to apply institutional controls. Those controls will be put in place if the 95% UCL on the population means exceeds 2.3 pCi/g.

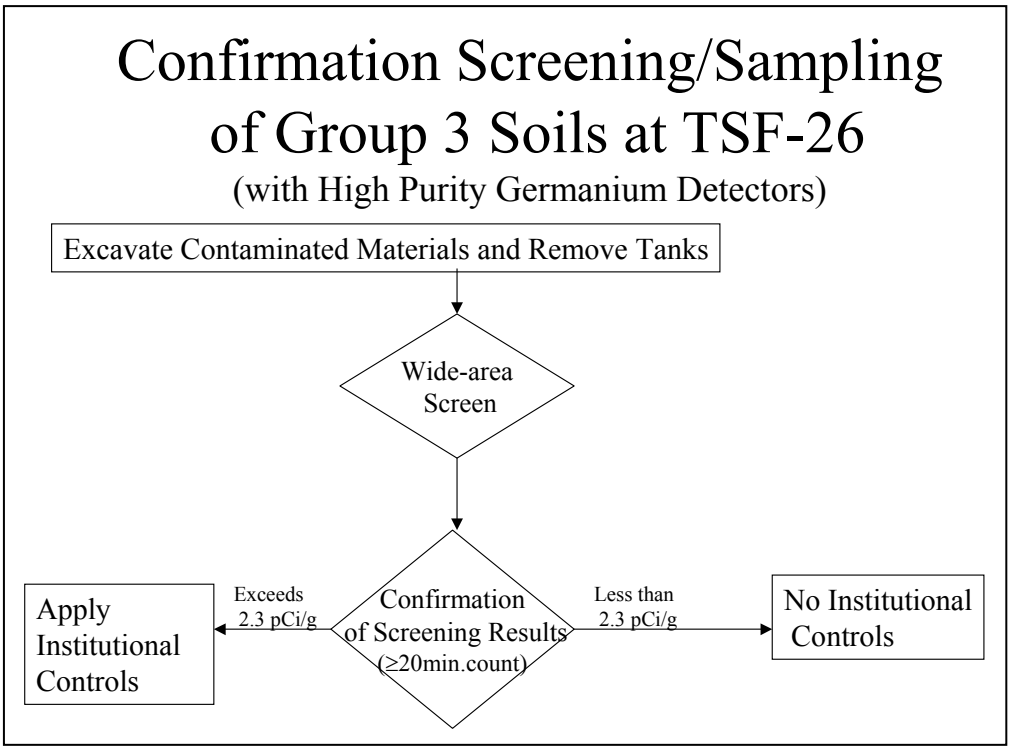


Figure 4-1. Confirmation screening/sampling logic.

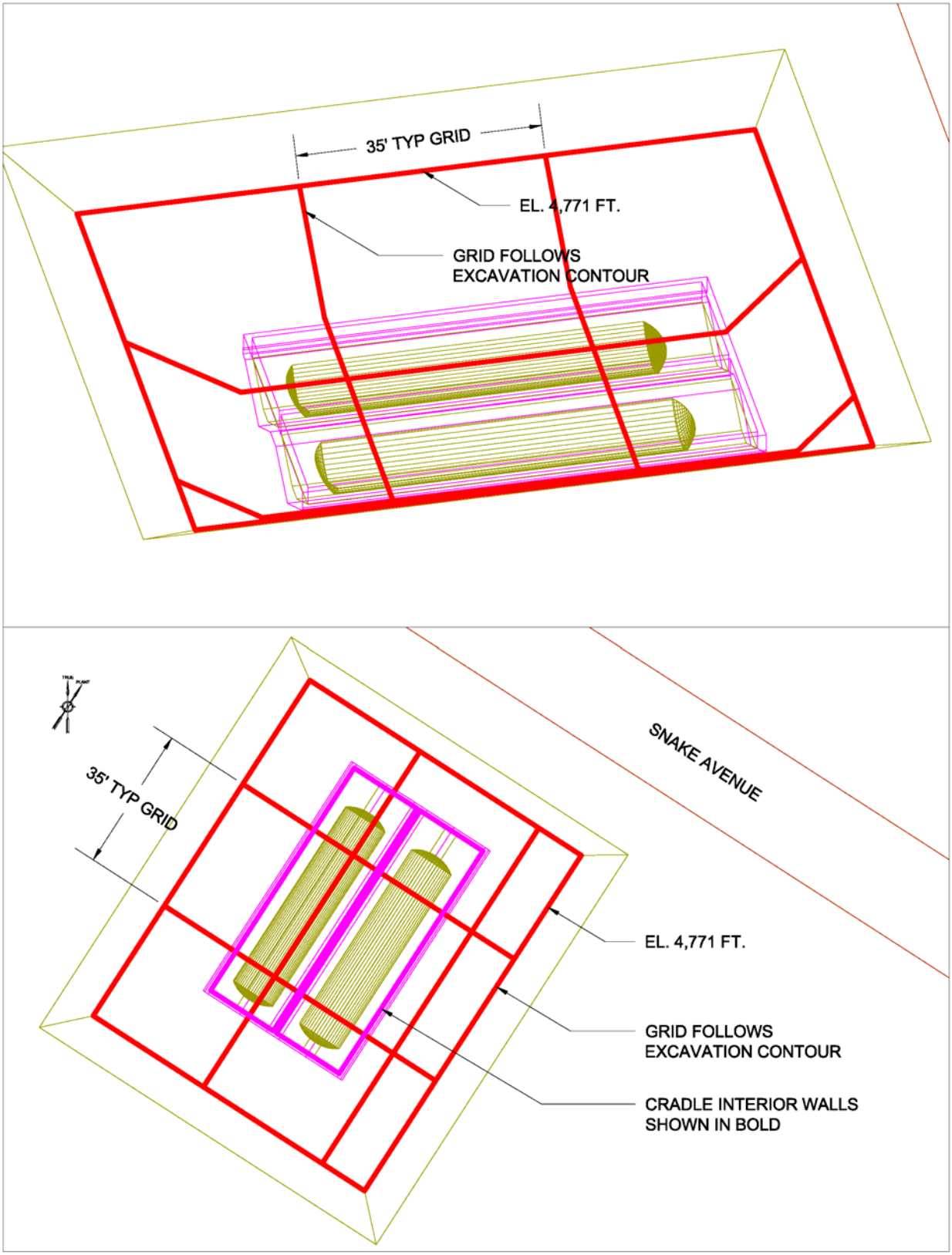


Figure 4-2. Preliminary wide-area screening grid.

5. SAMPLING PROCESS DESIGN

Specific procedures are required to handle the radiological samples collected during the PM-2A tanks sampling activities to ensure that the data are representative of the soil within the tank areas. This section outlines the specific sampling process design for these activities. The sampling requirements discussed here will guide the collection of representative samples as specified in the sampling strategy presented in Section 4. Procedures for sample collection are provided as guidelines for the field sampling team.

5.1 Presampling Meeting

Sampling procedures will be discussed each day in a presampling meeting. The meeting discussion will include, but is not limited to, sampling activities for the day, responsibilities of team members, health and safety issues, and waste management. Any deviations from the sampling strategy presented in this FSP will be documented in the field-sampling logbook.

5.2 Sample Collection

Prior to sampling, all sample locations will be identified, staked, and clearly marked with the appropriate designations. Staked sampling locations will be surveyed in accordance with the requirements set forth in PRD-5030/MCP-3480, "Sampling and Analysis Process for CERCLA and Deactivation, Decontamination, and Dismantlement (D&D&D) Activities," to establish horizontal (northing and easting coordinates) and vertical (elevation referenced to mean sea level) control. Permanent benchmarks will be used to reference the vertical control data and the horizontal grid coordinates.

Horizontal (H) and vertical (V) control will be consistent with standard third order accuracy,

where

H = 1/5,000 or 5 seconds of arc

V = 0.05 feet per M (length of loop in miles).

The bottom of the excavation is defined as the horizontal surface area immediately surrounding the former location of the tanks as well as the side slopes of the excavation up to an elevation of 4771 (i.e., 10 ft below the original ground surface). This area may include the cradles and sand, or if they are removed, the soils beneath their former location. The samples will be submitted for a gamma spectrometric analysis to evaluate Cs-137 concentrations in the soil, using field-calibrated high-purity germanium portable in situ gamma spectroscopy onsite. In addition, a NaI portable scintillometer will be used to scan the bottom of the excavation to identify any hot spots. Based on this screening, additional bias samples will be collected and submitted for gamma spectrometric analysis from any hot spots detected by the NaI portable scintillometer.

5.3 Personal Protective Equipment

The personal protective equipment (PPE) required for this sampling effort is discussed in the project HASP (INEEL 2004c) and the project radiation work permit.

5.4 Field Decontamination

Field decontamination procedures are designed to prevent cross-contamination between locations and samples. All equipment associated with sampling will be thoroughly decontaminated prior to daily activities and between sample locations, in accordance with PRD-5030/MCP-3480. Following decontamination, sampling equipment will be protected to prevent contamination from windblown dust.

5.5 Sampling Waste Handling and Disposition

Waste streams generated as a result of the PM-2A tanks sampling activities may include (but are not limited to) PPE, contaminated sample supplies and equipment, rinse water (which may be used in small quantities during sampling), and excess or spent samples. All waste streams that are generated as a result of the sampling activities will be containerized for disposal in accordance with the project WMP (INEEL 2004a).

5.6 Sample Equipment

Sampling equipment and supplies include, but are not limited to, the items listed below. Additional equipment deemed necessary to collect the samples may be specified in the logbook.

- Stainless steel hand augers
- Power auger
- Tape measure (30.5 m [100 ft])
- Wood stakes and ribbon (30.5 m [100 ft])
- Stainless steel spoons
- Stainless steel or aluminum pans
- Absorbent towels
- Plastic garbage bags
- Deionized water (20 L [5.3 gal] minimum)
- Nonphosphate-based soap
- Isopropanol
- Spray bottles
- Aluminum foil
- Pipe wrench
- Crescent wrench

- PPE as required by HASP, safe work permit, or radiological work permit
- Hammer
- FTL logbook
- Controlled copies of the FSP, QAPjP, HASP, and applicable referenced procedures
- Black ink pens
- Black ultra-fine markers
- Appropriate sample containers
- Ziploc plastic bags
- Clear tape
- Waste containers.

5.7 Documentation Revision Requests

Revisions to this document will follow MCP-233, "Process for Developing, Releasing, and Distributing ER Documents."

6. REFERENCES

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